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Research Notes related to the utility of HORSE CAVALRY and PACK ANIMALS in COUNTERINSURGENCY OPERATIONS in the Latin American environment

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Research Notes related to the utility of HORSE CAVALRY and PACK ANIMALS in COUNTERINSURGENCY OPERATIONS in the Latin American environment

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PREFACE

This paper has been prepared in response to a request by United States Army South for information concerning the employment of animals in military operations under conditions comparable to those which might be encountered in a counterinsurgency operation in Latin America. The paper is a compilation and summarization of historical cases, professional opinions, and information selected from an extensive literature on the use of animals in military operations. Each historical case summary is preceded by a brief statement of the basis for its inclusion in the paper.

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Appendices (continued)

RESEARCH NOTES RELATED TO THE UTILITY OF HORSE CAVALRY AND PACK ANIMALS IN COUNTERINSURGENCY IN THE LATIN AMERICAN ENVIRONMENT

1. Introduction

This paper presents selected historical examples of the employment of horse cavalry and animal-transported military units under conditions comparable to those which may pertain during a counterinsurgency situation in Latin America. In addition, there are included data on Latin American geography, topography, settlement patterns, population densities, transportation (rail, highway, and waterway), as well as statistics on motor vehicle availability and the numbers--by country--of animals suitable for mounts and draft or pack transport. The professional opinions and observations of a number of military officers on the utility of animal-mounted and/or animal-supported military units in Latin America are contained in the appendices, together with other illustrative material.

2. Assumptions

Modern technology will not materially change the mobility of foot troops operating in difficult terrain or in areas inaccessible to motorized units.

3. Definitions

a. Latin America, for the purposes of this paper, is construed to include Mexico and the Caribbean Islands, together with Central America and South America.

b. "Insurgency," "counterinsurgency," and associated technical terminology, as used in this paper, are consonant with the definitions in the Glossary of Counterinsurgency Terms, developed for the Special Group, CI, and published 17 May 1962.

4. Discussion

a. Following review of an extensive amount of literature, the case studies selected for this paper have been chosen as being illustrative of situations comparable to those which may be anticipated in counterinsurgency operations in Latin America. While the majority of the cases emphasize the fact that resort to the use of animals was dictated by the lack of more efficient means of transport, others stress the influences of climate, terrain, and human factors upon the utilization of animals in military operations.

b. Analysis of the factors which dictated the selection of animal transport indicates that the following have been dominant influences in the decision to use animals:

(1) Lack of suitable substitute means for transporting men, equipment and supplies for operations in remote underdeveloped areas and/or difficult terrain. [See Appendices A(1), A(2), A(3), A(5), B(1), B(3), and B(4).]

(2) The increased mobility of animal-mounted and/or animal-supported forces was required to counter similarly equipped insurgents or to achieve tactical superiority over the enemy. [See Appendices A(1), A(2), A(3), A(8), and A(13).]

(3) Lack of a road network or trafficable terrain in the zone of operations. [See Appendices A(3), A(2), A(4), A(7), A(8), A(9), A(10), A(11), A(12), B(1), B(2), B(3) and B(4).]

(4) Relative availability and utility of animals and motor vehicles in the zone of operations. [See Appendices A(1), A(2), A(5), B(1) and B(2).]

(5) Difference in inpact on the national economy resulting from the use of animals or of motor vehicles. [See Appendices B(1) and B(2).]

c. Analysis of the case studies discloses that various factors have influenced the degree to which the employment of animals contributed to the success or failure of the operations. While many of these factors are the same as those which dictated the decision to use animals, others are peculiar to the climate, terrain, and human factors of the environment in which the operations were undertaken. Of these factors, the following appear significant:

(1) Native animals acclimated to the environment of the operational region were more effective than imported animals. [See Appendices A(4), A(5), A(12) and B(1).]

(2) Less sophisticated indigenous equipment fitted better or was of greater utility with native animals than U.S. or other imported saddlery, vehicles, and equipment, thus providing more effective support to operations despite its presumed lack of efficiency. [See Appendices A(3), A(5), A(11), and A(12).]

(3) The climatic influences on roads, trails, animals, equipment

and men were more conducive to the utility of animals than of motor vehicles. [See Appendices A(3), A(5) and B(1).]

d. Problems encountered and lessons learned in the use of animals were as follows:

(1) Mules must be handles by persons experienced in their management, and must be let rather than herded. [See Appendices A(3), A(7), A(9), A(10) and A(11).]

(2) Mule loads must be carefully assembled and packed. [See Appendices A(3), A(7), A(9), A(10) and A(11).]

(3) Mules and horses require regular and adequate food, with inadequacy of food resulting in declining utility and/or loss of animals. [See Appendices A(3), A(4), A(10) and A(11).]

(4) In areas in which motor vehicles can be utilized, albeit with difficulty, their use for supply columns has been of greater utility than animals. [See Appendices A(5) and A(6).]

(5) Cavalry appeared to have been less effective than foot troops in actions wherein the speed and shock of cavalry formations could not be exploited. [See Appendices A(5) and A(13).]

e. The use of horses and mules or other pack animals in post-World War II insurgency situations has been limited. The outstanding instance of such use was in the Greek Army operations against Communist guerrillas in 1947-1949. During World War II horses and mules were used primarily to carry heavy weapons, communications equipment, and supplies. Post-World War II insurgencies generally have occurred in relatively well-settled areas; consequently, counterinsurgency military operations have concentrated on the defense of villages and plantations in order to deny to the insurgents access

to supplies and support. During the operations in Malaya and in the Philippines, for example, the need for heavy weapons and other heavy equipment was limited. Few of the post-World War II counterinsurgency operations have involved moving heavy equipment and supplies long distances in difficult terrain. There are large, sparsely settled areas in Latin America, such as in Colombia, Brazil, Bolivia, Peru, and other countries. It is in areas such as these that insurgency-counterinsurgency situations might parallel those encountered by Pershing in Mexico, the Marines in Nicaragua, or Wingate in Burma--in contrast to those encountered in Malaya or the Philippines.

5. Conclusions

The historical cases reviewed and the professional opinions of the authorities interviewed support the following conclusions:

a. The maintenance of some animal-mounted and/or animal-supported units in internal security forces is desirable in those countries having significant areas inaccessible to motorized forces.

b. Animal transport may be preferable when animal transport can be supported from indigenous resources and motor transport would require the use of foreign imports.

c. The insurgents' use of animals for off-road mobility may necessitate similar employment by the counterinsurgent force.

Appendix A

Historical Case Studies

(1) The Palestine Campaigns
(2) The Mexican Punitive Expedition, 1916
(3) U.S. Marines, Nicaraguan Campaign, 1927--1933
(4) Abyssinia, 1941
(5) German Use of Local Animals and Sleds in Russia, 1941--1943
(6) Pack Operations on Guadalcanal, 1943
(7) Wingate's Raiders--the Chindit Force in Burma, February--March 1943
(8) Provisional Mounted Squadron, Third Division--Italy, 1943
(9) Special Force in Burma--March-June, 1943
(10) Merrill's Marauders, 5307th Provisionsl Regiment--Burma, 1944
(11) Mars Task Force--Burma, 1944-1945
(12) Packing Along the Salween
(13) Greek Army Operations Against Communist Guerrillas, 1947-1949

The Palestine Campaigns

The Palestine campaigns were conducted in terrain similar to that which is found in parts of Brazil, Bolivia, Chile, and Peru. Allenby employed animals for the transport of heavy equipment and supplies for major elements of his forces. In addition, he took advantage of the increased mobility of mounted troops in order to concentrate his forces more rapidly than the enemy could assemble theirs and in order to achieve tactical surprise. The source text provides much material on the comparative strengths and weaknesses of animal-mounted and animal-supported troops operating in arid regions.

The Palestine Campaigns

These highly important and successful campaigns conducted by the Egyptian Expeditionary Force of the British Army under General Allenby in the Middle East during World War I resulted in the cessation of Turkish control in that area. They are known as the Palestine Campaigns.

The stated objectives of the campaigns that culminated in the capture of Jerusalem had been to frustrate the Turko-German expedition against Baghdad, to engage Turkey's last reserves of men, and to invigorate Britain's resolution at a time when the apparently unbreakable deadlock in the main theatre was tending to discouragement. All these purposes had been accomplished before the end of 1917.

Since the terrain frequently encountered was unsuitable for wheels, to a very considerable extent resort was made to horse cavalry organized variously as the campaigns developed, and to other animal transportation. At one stage, for example, the Desert Mounted Corps facing Gaza consisted of: (1) the Yeomanry Mounted Division (the 6th, 8th, and 22nd Mounted Brigades plus the 26th Horse Artillery Brigade); (2) the Australian and New Zealand Mounted Division (the 1st and 2nd Australian Light Horse, and the New Zealand Mounted Rifle Brigades plus one Brigade of Royal Horse Artillery and the Imperial Camel Corps Brigade). Indian cavalry units and various mountain batteries were also employed.

The total number of animals employed in the whole theatre in September 1918 included 75,000 horses, 40,000 mules, 35,000 camels and 11,000 donkeys.

Manpower strength--including British, Indian, and Egyptian troops--totaled 468,000.

Regarding the use of donkeys, in the vale of Ajalon (operations around Jerusalem) "roads marked on the map as Roman roads turned out to be mere goat tracks, quite impassable for wheels, and even for camels, without improvement. The only means of portage between villages in these hills was by donkey."[1]

The two actions at Magdhaba and Rafa in the heavy-going of the Sinai Desert are excellent examples of the potentialities of boldly-handled mounted troops and also of the limitations placed upon them when they are set to attack entrenched positions while dismounted. Mounted troops require an extra proportion of artillery to compensate for the lack of firepower since a mounted force shrinks to little more than half its strength when committed to an attack on foot.

The Camel Corps Brigade showed its value in these engagements; though less mobile than the Light Horse Brigades, it could deploy a deeper and more solid body for dismounted attack since it could put some 1,600 to 1,700 rifles into the firing line. The question of water for the animals of the force placed another important limitation on these operations; here again the Camel Corps had an advantage.

With respect to the relative power and limitations of a force carried in mechanical vehicles rather than on horses, it is recognized that much of the terrain was distinctly favorable in various parts of Palestine and would have permitted maneuver to any form of mechanical transport. On the other

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1. Wavell, (Col.) A.P. (C.M.G., M.C.). The Palestine Campaigns. London: Constable and Co., Ltd., 1929.

hand, the Sinai desert would not have permitted such maneuvers. Also, the Judean Hills and the Mountains of Moab are almost impractical for the maneuver of mechanical vehicles. It is the author's opinion that a mechanized force could not, for example, have participated in the first advance on Jerusalem, nor in the capture of Jericho, nor in the two raids east of the Jordan, as the Cavalry did.

Thus, the obvious conclusion appears to be that, where terrain and other natural conditions so indicate, animal transportation is indispensable.

The principal contributions of animals in the Palestine campaign were to extend the range and mobility of combat units beyond that of foot troops and to transport supplies in terrain unsuited to the use of motorized transportation. The success of the campaign was favorably influenced by the fact that the commander used his animals in roles which provided a critical margin of superiority to the units so supported.

Source:

Wavell, (Col.) A.P. (C.M.G., M.C.) The Palestine Campaigns. London: Constable and Co., Ltd., 1929.

The Mexican Punitive Expedition, 1916

Pershing's operation in Mexico was conducted in sparsely settled arid regions comparable to some which are found in Brazil, Argentina, and Chile. This operation demonstrated some of the limitations of traditional horse cavalry formations in irregular or guerrilla warfare. The lack of heavy weapons was noted in operations against villages and in cases in which the troops were required to fight on foot or to hold terrain. The inadequacy of the roads and the use of animal mounts by the bandits influenced the reliance upon mounted forces for this expedition. The source text has valuable information concerning the support of animals in field operations.

The Mexican Punitive Expedition, 1916

This expedition, under the command of General Pershing, had the objective of breaking up bandit bands under Pancho Villa which had been marauding across the U.S.-Mexican frontier. The operation provides an example of the large-scale employment of horse cavalry, horse-drawn artillery, and pack animals.

Pershing's force consisted of elements of the 7th, 10th, 11th and 13th U.S. Cavalry, the 6th Field Artillery, together with support units and pack trains. General transportation was provided by a combination of motor vehicles and animal-drawn escort wagons. Villa's bands were comprised of animal-mounted and foot elements only.

The poor condition of the Mexican roads and the conduct of operations in difficult mountain terrain made the use of draft and pack animals indispensable. Typical examples of reliance on pack animals are:

a. The machine-gun troop (pack transported) which accompanied the 10th Cavalry to Parral (600 miles south of the border) was credited with preventing the annihilation of the cavalry at a time when the troops were exhausted and carbine ammunition was low. (Numerous instances occurred in which cavalry fighting on foot was of limited utility for lack of supporting fire power.)

b. The 10th Cavalry, divested of its pack train support, was able to continue operations with six pack mules, one for each troop and one for the quartermaster. These pack animals made it possible

for the troops to accomplish their mission in the field west of Chihuahua.

c. Throughout the campaign, pack trains were relied upon for the transport of supplies and for evacuation of the wounded. Even when the columns which penetrated Mexico were forced to live off the land, pack animals were indispensable in collecting and distributing rations.

d. In his report following the Punitive Expedition, Major Frank Tompkins, one of the cavalry squadron commanders, recommended a pack train of 12 mules for each troop of 50 men.

Throughout the campaign, the limited road network and poor condition of existing roads forced reliance upon pack animals for support of operations despite the availability of motor vehicles.

A significant difficulty encountered in the use of animals in the campaign consisted of the acquisition and distribution of grain. Most Mexican grain contained contaminants which caused United States horses to reject it.

Source:

Tompkins, Frank. Chasing Villa. Harrisburg, Pennsylvania: The Military Service Publishing Company, 1934.

U.S. Marines--The Nicaraguan Campaign, 1927-1933

The conditions existing in Nicaragua in 1927-1933 were not totally dissimilar from those which still exist in some parts of Latin America. The experiences of the Marines in Nicaragua were paralleled in Haiti and Santo Domingo. The sources selected for illustration of this experience are only two examples of a voluminous literature. The summary contained herein represents the consensus of many authors and observers. The sources cited offer valid observations on most of the problems encountered by the Marines in Nicaragua and are particularly illustrative of the contribution of animals to the Marine achievements in that country.

U.S. Marines: The Nicaragua Campaign, 1927-1933

A U.S. Marine expeditionary force was maintained in Nicaragua from January 10, 1927, to January 2, 1933, during which time it engaged in active counterinsurgency operations against Sandino and trained a constabulary, the Guardia Nacional de Nicaragua. The Marines' counterinsurgency operations against Sandino were begun on July 2, 1927, and continued in conjunction with those of the Guardia until the date of withdrawal. At its peak strength the Marine expeditionary brigade was composed of two infantry regiments and an aviation unit. Sandino's forces seldom numbered more than 200-500 men.

In the counterinsurgency operations there was extensive use of horses and mules, both as mounts and as pack animals. These horses and mules were purchased locally; only indigenous animals were employed by the Marines. Sandino and his insurgents operated in the mountainous northwestern region of Nicaragua. The supplies for the United States forces arrived at the Pacific Coast town of Corinto and were sent to Ocotal, an area supply point. Because of poor roads, the trip from Leon to Ocotal, about 160 miles, required from 11 to 13 days by bull cart. Trucks, caterpillar tractors, and aircraft were also used on this supply run but were of limited utility because of difficult terrain. From Ocotal, deliveries were made to the different outposts by air or by pack train. An indication of the difficulty in building

roads in the terrain of this area is that a road program which lasted from August 1929 to September 1930 resulted in the contruction of only 11.2 miles of roadway and 36 small bridges or culverts.

Because of the mountainous terrain and the lack of roads, the counterinsurgent troops were required to proceed in pursuit of the bandits by foot and/or on mounts--horses or mules. Pack animals were used for transporting supplies. Air service was utilized to some extent in the transport of supplies, and in providing information on movement of the bandits. At times the low-flying planes accidentally created havoc with the native animal pack trains. Many mules and their packs were lost when the mules panicked while travelling along precipitous cliffs. The difficulties of the terrain were aptly described as follows by a Marine Corps captain who participated in this campaign:

> "It is certain that few lands can present the soldier with the contrarieties he must face in the northern parts of Nicaragua. There are two forms of terrain, up and down; two seasons of the year, rainy and dry; two sorts of natives, apathetic and bandit. The native has two items of diet, tortillas and frijoles; the riding animal, corn and grass, and in April, May, and June, the grass is sparse or entirely gone. The thoroughfares are the 'camino real' and the 'picada.' The 'camino real' may have the bush cleared as far as fifteen feet on either side in places, while the 'picada' will probably show only enough machete slashings to indicate the course it follows. There is an occasional stretch of 'carretera' or bull cart road but these end long before the soldier reaches bandit territory . . . knife-like ridges separated by abysmal gorges . . . which Sandino had boasted he'd make impregnable . . . There were days when for five-hour stretches one could not see a solid ray of sunshine through the growths over the trail . . . ,"*

*(Capt.) Maurice C. Holmes (U.S.M.C.), "With the Horse Marines in Nicaragua," The Leatherneck, XIV (April 1931), p. 7.

The insurrectionists, by ingratiating themselves with the villagers and others throughout the countryside and by getting supplies from across the border, could manage to live "on the land." The Marine force, however, found it necessary to take supplies with them while pursuing the bandits. These supplies included food for themselves and forage for the animals. Without animal transport, movement through this geographic area would have been manifestly impossible.

Experience showed two other good reasons for the use of animal-mounted troops. The bandits shot at what they expected to be foot patrols and as a result shot the mules instead of the mounted Marines. The greater alertness of the mounted soldier who, instead of having to watch his footing on the trail, could be alert to the possible existence of the enemy in the jungle area, constituted another advantage.

The use of animals in the Nicaraguan campaign was not without its difficulties. A major problem was the inexperience of the men in the handling of mules or in the proper method of preparing and loading the packs. Proper saddlery for the small native animals also constituted a problem. Furthermore, food for the animals at times was exceedingly scarce and many animals were lost from starvation. At times the local "moonshine" was used as a dietary supplement and stimulant for the native horses when their strength was about gone.

Although there was divergence of opinion as to the relative utility of horses and mules, some maintained that the horses were more useful. It was pointed out that they required more care on the trail and more food than the mules and that they must be shod more frequently;

however, the horses would keep going longer and at a faster gait than the mules. It was, of course, the balkiness of the mules that gave the inexperienced handlers the greatest difficulty.

It is the concensus of the authors and other observers that it would have been impossible for the U.S. expeditionary force to have suppressed Sandino and his insurgents in the mountains of Nicaragua without the utilization of animal-mounted troops and pack trains. Lacking a road network the troops could not otherwise have reached the jungle outposts in the mountains where Sandino had sought refuge from which to carry on his insurgency.

Capt. Holmes believes that the Nicaraguan campaign demonstrated that aircraft were helpful with reconnaisance and in providing some supplies, but the ferreting out of the insurgents in an effective counterinsurgency operation could be implemented only by the utilization of land forces.

In the Nicaraguan campaign the most effective patrol force for off-the-road operations consisted of a combination of mounted and dismounted elements accompanied by pack animals.

Sources:

1. Holmes, (Capt., U.S.M.C.) Maurice G. "With The Horse Marines in Nicaragua," The Leatherneck, XIV (April 1931), 5-7, 50-55.

2. Nalty, Bernard. "Nicaragua (1927-1933) in Counterinsurgency in the 20th Century." (Task NUISMATICS; Washington: Special Operations Research Office, The American University to be published in 1965).

Abyssinia, 1941

The British operations in Abyssinia (Ethiopia) are illustrative of the contribution which animals can make to operations in an environment unsuitable for the animals utilized. Just as San Martin achieved success under comparable circumstances in his 1817 campaign against Chile, any counterinsurgency operation in the Andes could necessitate similar utilization of animal support.

Abyssinia, 1941

With the declaration of war by Italy on the United Kingdom and France in June 1940, Great Britain found an Italian army numbering 300,000 men in Abyssinia and Eritrea interdicting her Red Sea supply lines. A campaign was begun almost at once to reduce this threat; however, the forces available to the British were small compared to those available to Italy. The existence of an anti-Italian Ethiopian guerrilla movement was an advantage the British seized upon to offset partially the disparity of numbers. This guerrilla movement was particularly strong in the Gojjam area of Abyssinia, which is located near its border with the former Anglo-Egyptian Sudan. Colonel (later General) Orde Wingate, of the British Army, proposed that an irregular force of British and Ethiopian troops enter the Gojjam from the Sudan to cooperate with the resistance movement in the war against the Italians.

This force, under Wingate's leadership, was known as the Gideon Force. It was directed to march into the Gojjam to stimulate the Ethiopian guerrillas to further attacks on the Italians and, if possible, to drive them from the area completely. The Gideon Force found it necessary not only to carry its own supplies and equipment but also the weapons, supplies and explosives needed by the Ethiopian guerrillas. The march traversed the waste lands of the southern Sudan and climbed several thousand feet over an escarpment to the plateau of Gojjam. No roads or bridges existed in the area and the attempts to use motor vehicles there failed. Since there was not time enough to collect the 5,000 mules believed necessary to carry the unit's equipment, 15,000 camels were purchased [illegible]. Many Sudanese took advantage of the urgency of the situation to sell their [illegible]

and sick camels to the British; consequently, some 3,000 camels were unfit for service.

The Gideon Force, supported by 15,000 camels, began its march in January, 1941. The force, which numbered almost 2,000 men, was made up of the Sudanese Frontier Battalion and the 2nd Ethiopian Battalion. The march into the highlands of Abyssinia was tortuous, and the altitude, the scarcity of the lowland thorn bushes on which the camels thrived, and the exhausting conditions of the march caused heavy casualities among the animals. On the march, most movement was at night. This made marching easier for the camels and avoided the danger of air attack. The heaviest weapons carried by the camels were two mortars (size unknown) and Vickers and Hotchkiss machine guns. No air-dropped supplies were available and the Gideon Force had to subsist entirely on the supplies being carried by men and camels.

Upon reaching Abyssinia, the Force, together with the Ethiopian guerrillas, engaged the Italians in several successful actions. By the time the British army, coming from Kenya, had captured the Abyssinian capital of Addis Ababa, the whole of the Gojjam had been cleared of Italians. Wingate was able to proceed to the capital, bringing with him Ethiopian Emperor Haile Selassie. The Gideon Force reached the capital with only seven of its original 15,000 camels, the rest having succumbed, principally because of exhaustion and lack of fodder.

The Gideon Force achieved its objectives at the expense of all its animals. An officer who participated noted that without the camels the campaign would have been impossible. It is difficult to appraise the value of the contribution of the Gideon Force to the rest of the Abyssinian campaign in view of the weakness of Italian resistance to all British attacks. Nevertheless the operation provided a precedent for the more ambitious expeditions which Colonel Wingate later was to organize and lead in the war in Burma.

Sources:

1. British War Office. The Abyssinian Campaign. London: His Majesty's Stationery Office, 1942.

2. Mosley, Leonard. Gideon Goes to War. New York: Charles Scribner's Sons, 1955.

3. Allen, W.E.D. Guerrilla War in Abyssinia. Harmondsworth, London: Penguin Books, 1943.

German Use of Local Animals and Sleds in Russia, 1941-1943

The experience of the Germans in Russia illustrates the problems of a highly sophisticated military force operating in a less sophisticated environment. This example is most interesting for illustration of the fact that manifestly inferior native animals and equipment may be more useful in some environments than more sophisticated facilities developed for distinctly different circumstances. Aside from the quoted material in this summary, the source texts reflect the German commanders' frustration in coping with unanticipated tactical problems.

German Use of Local Animals and Sleds in Russia, 1941-1943

During the campaigns against Minsk, Smolensk and Moscow, German armored divisions were forced to use native animals and sleds in the winter and spring seasons.

Russian forces remained mobile through the reliance on animal transport, knowledge or the terrain, and construction of winter roads on snow or ice.

Lt. Gen. Fritz Bayerlein, at that time C-3 Panzergroup Guderian, complained that Russian roads did not follow courses shown on the maps and that in the spring they completely disappeared. The following extracts from his notes provide comparisons of the utility of animals versus mechanized transport in severe winter operations.

> (1) In January 1942, snowfall became heavier and the depth of the snow reached a height of over six feet. For supply and other movements, roads had to be shoveled free.
>
> (2) Because of the lack of experience, our troops often hit the deepest snow. The Russians, because of their natural environment, almost instinctively sensed with certainty positions on which the depth of the snow was negligible, such as heights, windprotected slopes or rolling ground.
>
> (3) The Russians build winter roads in peacetime according to the reports of prisoners. Often these never completely corresponded to roads designated on the map. Even with the most powerful vehicles, the maintenance of supply and communications would have hardly been possible without the employment of horses and sleds. The so-called Russian peasant "panje" horses accomplished the almost impossible under these most difficult conditions, such as snowstorms, fog and darkness. Even we armored troops had to depend to a great degree on supply by horses. The peasant sled served the

best purpose for this. Attempted German constructions of larger and sturdier sleds proved to be almost useless because they were heavy and clumsy. Fortunately, the Russian peasant horse did not require much upkeep. For example, fed for weeks on end only with straw, part of which was taken from house roofs, he could produce great accomplishments. These horses have in addition a highly developed sense of direction.

At the end of January, after more extensive withdrawals, the task force marched to another battle zone northeast of Yukhnov. During this time we recognized everywhere that we were no match for the difficulties of travel in the winter. The cleared roads were clogged by frequent oncoming traffic and the prepared by-passes were in no way sufficient. For motor vehicles, horse-drawn vehicles and sleds moving in opposite directions there was only one lane available. In every village vehicles and personnel crowded together.

(4) In comparison, the Russian system was ideal. In the winter time, separate roads for motor and horse-drawn traffic were used and only authorized for traffic in one direction. Our re-supply arteries always had to be protected by patrols because Russian reconnaissance parties and partisans on skis disturbed the traffic by sniping and attempted to lay mines that were effective against horse-drawn traffic as well as the infantry.*

Further German experience is reported in Manuscript No. P-090, Documents of the Historical Division, Headquarters, USAREUR.

At the outbreak of the Second World War, the German Army consisted of two million seven hundred forty thousand men organized in 106 divisions. It contained 583,000 motor vehicles, 514,000 horses, and 94,000 motorcycles. The German Army had one Cavalry brigade which was expanded later into a cavalry division, the First Cavalry Division. Besides horses, the First Cavalry Division also had motorized elements. At the beginning of the war each infantry division contained a cavalry reconnaissance battalion.

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*Fritz Bayerlein, Lt.Gen., German Army, "With the Panzers in Russia 1941-43," The Marine Corps Gazette, LVIII (April 1954).

The German campaign in the U.S.S.R. put a tremendous strain on all forms of transportation. More and more German units relied on horse-drawn transportation as a result of the fact that both fuel and motor vehicles became in short supply as the war progressed. The shortage of motor vehicles developed as a result of the inadequacies of production, a lack of spare parts, and the hard wear the vehicles received on the poor or non-existent roads of Russia. The severe winter weather which was encountered also reduced the effectiveness of motor vehicles.

It was stressed that, in animal operations, proper care was important, and this depended upon the training of the men who handled the horses. Most of the casualties among horses in Russia resulted from overexertion or lack of fodder and not from enemy action. Mules, of which the German Army had very few, proved tough when handled with intelligence and patience. The extent of animal use by the German Army can be judged from the fact that in 1942 about 120 tons of an infantry division's 300-ton supply train was horse-drawn.

The German First Cavalry Division operated as a cavalry unit only in 1941. Early in 1942 it was converted to a panzer division. This did not eliminate the appearance of German cavalry in Russia, however, as several regimental-sized cavalry units continued to operate with infantry or panzer divisions. In comparison with panzer units, the cavalry was felt to lack punch and could not go so far or so fast as motorized units. Later in the war, the Germans formed a cossack brigade, using Russian POW volunteers. These cossacks were used against the Tito partisans in 1944. They were not particularly successful in mountain warfare, as the partisans could not out-maneuver the horses, and the

cossacks coming from the plains of Russia were not familiar with mountain warfare. The most conspicuous successes of the cossacks were in the rapid envelopment of partisan groups who entered the valleys on forays.

After 1942 the principal means of transportation for an infantry division was horse-drawn equipment. Each brigade had 641 horses and 240 carts. All artillery was horse-drawn. The German Army made much use of the small Russian panje horses liberated from the occupied populace. Some problems were met with these small animals, however, in that German harness and other equipment did not suit them. Over long supply lines, horses were rather ineffective and, when available, motor vehicles were far superior.

Forage for horses in Russia consisted of oats and hay in the following proportions; for cavalry mounts, 5 kilos of oats and four to five kilos of hay per day. In the first winter in Russia in 1941 severe losses were incurred among the German horses when the German Army overran its supply lines. Little forage was available from captured sources, and the oats and hay that were shipped from Germany often became moldy en route to the front.

Caucasus, 1942. German experiences in the Caucasus Mountains in the fall of 1942, particularly after the rainy season has set in, showed that only the small native panje horses which were procured locally were suited for transport operations. The pack animal equipment needed for pack operations was also procured from captured stocks. The Germans found that horse-drawn vehicles were too heavy and also that wheeled or tracked motor vehicles were unsuitable for use in woods and mountains. The evacuation of wounded was also accomplished on pack animals. Three pack trains maintained

a daily schedule for a regiment, hauling supplies from base areas up to the regimental positions in the mountains. Where pack animals were not available in the mountains, supplies and wounded had to be hand-carried by the troops. The roads that existed in the valleys became impassable to motor vehicles due to the mud which resulted from the fall rains.

The Germans found that horses could play a significant role in swamp, woods, or mountain areas; however, the decisive campaigns of the war were not fought in such terrain. It was also found that the training of the personnel handling the horses was extremely important to the successful use of animals, particularly in the severe winter conditions found in Russia. It was the German officers' consensus that, except perhaps for mountain operations, they would have preferred to have replaced all their horses with motor vehicles if this had been possible.

Sources:

1. Bayerlein, (Lt.Gen.) Fritz (German Army). "With the Panzers in Russia, 1941-43," The Marine Corps Gazette, LVIII, 1954.

2. Mueller-Hillebrand, (Maj. Gen.) Burkhart (German Army). "Horses in the German Army; Manuscript No. P-090." Published by The Historical Division, Headquarters USAREUR.

Pack Operations on Guadalcanal, 1943

The operations of the pack artillery in the Guadalcanal campaign illustrate some of the logistical and tactical problems to be considered in the use of animal transport. Particularly to be noted are the logistical problems of supporting the animals themselves, in addition to support of the tactical unit; also note the tactical problems resulting from attempts to mix animal and motor transport on a limited road net. The conditions existing on Guadalcanal could be duplicated in many of the coastal regions of Brazil, Colombia, and Ecuador, or in Central America.

Pack Operations on Guadalcanal, 1943

In January 1943 the 97th Field Artillery Battalion was formed in New Caledonia for use on Guadalcanal during the closing days of the campaign. The unit, consisting of three firing batteries, each containing four 75-mm pack howitzers, landed on Guadalcanal with 1,000 mules (about 200 above normal for a pack battalion). Within two months there were between 95 and 150 animals on sick call each day, due mostly to foot troubles. The following observations were made concerning the operations of the battalion: "The presence of the animals complicated rather than simplified the logistical problem. Mules could not traverse all the types of terrain that a man on foot could negotiate. They could not get over boggy ground, or cross muddy banks and stream beds. Although able to cover from four to five miles per hour over favorable terrain, the mules could cover only one mile per hour over Guadalcanal's roads and trails. As a result, they caused traffic jams and impeded the trucks. Nor could the battalion easily supply itself. Each firing battery had 193 men and 117 mules. This entire strength was required to transport the four 75-mm pack howitzers and 200 rounds of ammunition allotted to each battery. To assist in moving ammunition forward, one ammunition section from the Service Battery--including 43 pack mules and 23 riding mules--was attached to the firing battery, to increase its strength to 212 men and 183 mules. But each mule required eight pounds of oats and 14 pounds of hay per day for feed. Thus, keeping four guns in action required the services of 212 men and 183 mules. To feed the mules necessitated hauling 1,500 pounds of oats and 2,600 pounds of

hay to the front daily by some agency other than the firing battery, for the mules could not haul feed as well as howitzers and ammunition. The experiment was unsuccessful."*

Sources:

1. Miller, John. United States Army in World War II—The War in the Pacific (Guadalcanal: The First Offensive). Historical Division, Department of the Army. Washington: Government Printing Office, 1949.

2. "Pack Operations on Guadalcanal," Cavalry Journal (November-December 1945), 45-47.

*Miller, John. United States Army in World War II--The War in the Pacific (Guadalcanal: The First Offensive). Historical Division, Department of the Army. Washington: Government Printing Office, 1949.

Wingate's Raiders--the Chindit Force in Burma, February-March 1943

General Wingate's operations in Burma in 1943 are considered typical of those to be encountered in tropical jungles and mountains. This case illustrates the utility of animals in such operations and the disastrous consequences suffered because of failure of the animal-supported effort.

Wingate's Raiders--the Chindit Force in Burma, February-March 1943

General Orde Wingate, a veteran of successful behind-the-lines experience in Ethiopia in 1941, believed that central Burma was only lightly held by the Japanese and therefore vulnerable to penetration. A Long Range Penetration Group (LRPG) was formed in India in the fall of 1943. The LRPG was made up on one battalion of British troops, one battalion of Gurkhas and one battalion of Burmese soldiers. They were supported by several sections of RAF personnel, a signal section and one Mule Transport Company manned by Gurkhas. The total force consisted of about 3,000 men and 1,000 animals. The majority of the animals were mules, but since the number obtainable locally was not sufficient, bullocks were purchased and trained as pack carriers. A few elephants were also included. Officers used horses as mounts.

Wingate's LRPG began its march into Burma on February 8, 1943. After a march of nearly 500 miles, which entailed the crossing of two major rivers, the force arrived in central Burma. The march through the jungle-covered mountains proved exhausting. After the first brush with the Japanese the elephants' mahouts vanished. Since no one else in the force was able to guide these animals, they were unloaded and abandoned. Feed for the remaining animals was supplied by air-drop at arranged drop zones. Shortly before crossing the Irrawaddy in central Burma one NCO in the force noted:

"The mules too, were showing the strain. They were not in so bad a way as the horses, being better equipped by nature for roughing it, but they

were becoming definitely part-worn all the same. For one thing it was impossible to feed them regularly...."* Despite the hardships of the march, most of the mules and 80 of the bullocks crossed the Irrawaddy in central Burma. On the other hand, as noted, the elephants had been abandoned and the majority of the horses had fallen behind and had been destroyed.

During the campaign, animal loads consisted of heavy weapons such as 3-inch mortars, Vickers machine guns, the ammunition for these weapons, radio equipment, and medical supplies. After action with the Japanese the mules were also used to carry casualties.

By the end of March 1943 it was decided that the force should return to India. The majority of the mules were slaughtered and the force was broken up into small groups, each to make its way back to India independently. The mules not killed were used to carry radio equipment and casualties. However, before the major river barriers could be crossed, the force had to destroy or abandon all of its animals together with the equipment and casualties they were carrying.

Once the remaining animals had been destroyed and the radio equipment abandoned, it was impossible for the troops to arrange for re-supply and support from the air. During the return march, without animals or air support, the force suffered its heaviest casualties.

Eventually 2,000 of the 3,000 men of the LRPG who had started returned to India.

*David Halley. With Wingate in Burma. London: William B. Hodge & Co., Ltd., 1946.

Sources:

1. The War Against Japan, Vol. 3. London: Her Majesty's Stationery Office, 1959.

2. Prasad, S.N., et al. The Reconquest of Burma. (Indian Armed Forces in World War II, Ed. Bisheshwar Prasad, Vol. I.) Calcutta: Orient Longmans, 1958.

3. Fergusson, Bernard. Beyond the Chindwin. London: St. James Library, 1945.

4. Halley, David. With Wingate in Burma. London: William B. Hodge & Co., Ltd., 1946.

5. Mosley, Leonard. Gideon Goes to War. New York: Charles Scribner's Sons, 1955.

Provisional Mounted Squadron, Third Division--Italy, 1943

This case history illustrates the utility and mobilty of a mounted force, as compared with that of foot patrols in a mountainous but lightly wooded area of operations such as may be found in much of the upland regions of Central and South America.

Provisional Mounted Squadron, Third Division - Italy, 1943

After the fall of Sicily in July 1943, the Third U.S. Infantry Division collected approximately 129 horses and mules from captured enemy stocks and formed a provisional horse reconnaissance troop. The unit eventually grew to 130 men, 143 horses, and a pack train of 30 men plus 350 mules. In Italy a pack battery of four 75-mm pack howitzers with 125 mules was added to the force.

After its arrival in Italy in September 1943, the horse troop was used on reconnaissance missions. The troop executed these missions with speed and daring and was invaluable to the division commander. This success was due largely to the troop's ability to move cross-country in mountains either by night or day with a minimum of noise, and to cover ground accessible only to animals or foot troops. The pack battery was constantly used by infantry in the mountains and was successful in bringing artillery fire on enemy positions from the flanks. The pack train was used every day during combat to deliver supplies of ammunition, water, and food to troops that were in forward positions where vehicles could not go because of the terrain or the tactical situation.

Where open terrain was encountered, the animals were moved forward by truck so as to be available when needed. Lack of replacements for mounts and equipment eventually forced the disbandment of the units.

Sources:

1. Baker, Raymond F. "Horses were used," Cavalry Journal (May - June 1946), 30-32.

2. Netterblab, (Capt.) A.F. "Tactical Employment of a Provisional Mounted Squadron," Cavalry Journal (March - April 1945), 68, 69.

Special Force in Burma, March–June 1944

This Burma experience provides a good illustration of the problems to be anticipated by a commander undertaking large-scale operations in remote jungle operations. While there is considerable material in the cited sources on both the contribution of animals to the mission and the magnitude of the logistical support of animals in the jungle operation, the point of this case history is that despite adequate preparation the effort may not be justified by the results produced.

Special Force in Burma, March-June 1944

On the basis of the experience gained by the 1943 Chindit column, General Wingate planned a more ambitious operation against central Burma for the spring of 1944. The operation differed from the earlier one in size and in the manner of its air support. The Special Force (as it was then called) was made up of the 16th British Brigade and the 77th and 111th Indian Brigades. The 16th British Brigade was ordered to march into Burma in essentially the same manner as the Long Range Penetration Group had done a year earlier. However, the 77th and 111th Indian Brigades were airlifted into central Burma to pre-selected drop zones. These landing grounds (called strongholds) became the behind-the-lines bases for the Special Force Brigades. Air strips were built to receive and resupply the Brigades who were carried in by C-47's and gliders. Casualty evacuation was also accomplished by aircraft, a feature not found in the earlier operation.

General Wingate was adamant that the Brigades not be sent into Burma without mules. Consequently for the first time provisions had to be made for the airlifting mules in C-47 aircraft and WACO gliders. Once the Brigades had assembled at the strongholds they set off in columns on their assigned missions. Mules were used by the columns to carry the heavy weapons, ammunition, radio and surgical equipment. Casualties were also carried on mules until they could be evacuated either by glider or light plane. Altogether, about 10,000 men and 1,300 mules were flown into central Burma in March 1944. The 16th British

Brigade marched 400 miles overland with mules to join the two airlifted Brigades.

The novel feature of this operation, the movement of mules in planes and gliders, was accomplished without difficulty. The aircraft required makeshift stalls to prevent the animals from shifting, slipping or otherwise injuring themselves or the aircraft.

In both the Chindit and Special Force operations, feed for the animals was provided by air drop. Most feed was free dropped and the cascading bales of hay and feed proved hazardous for both men and animals as some casualties resulted.

The Special Force remained active against the Japanese from March 1944, until early June of the same year. It established several strongholds or blocks along enemy lines of communication. The coming of the Monsoon rains in May reduced the reliability of air re-supply, upon which the force depended. It was moved out of central Burma (on foot), to join the Chinese and American forces in Northern Burma. Marching with mules over jungle-covered mountains under Monsoon rains proved extremely arduous. Some columns found that, at best, they could cover but 4 miles a day. The mules continually slipped and fell and had to be unloaded and repacked. The troops and animals were never dry. Exhausted and malaria-ridden, the utility of the Special Force was low indeed by the time it reached Northern Burma.

The Special Force had fought the Japanese in a number of indecisive engagements and probably inflicted as many battle casualties as it received. However, considering its size, this attempt to use air-supplied and mule-supported troops behind Japanese lines lacked the success that Wingate had anticipated. The cost in resources consumed and in non-battle casualties was very high.

Sources:

1. Prasad, S.N., et al. The Reconquest of Burma. (Indian Armed Forces in World War II: Ed. Bishewar Prasad, Vol. I) Calcutta: Orient Longmans, 1958.

2. Mosley, Leonard. Gideon Goes to War. New York: Charles Scribner's Sons, 1955.

3. Masters, John. The Road Past Mandalay. New York: Harper and Brothers, 1961.

4. The War Against Japan. London: Her Majesty's Stationery Office, 1959.

Merrill's Marauders, 5307th Provisional Regiment--Burma, 1944

The experiences of Merrill's Marauders are contemporary with those of General Wingate's British Forces in Burma. This case history is cited for its illustration of the effects of physical and cultural environment upon the men and animals committed to the operation. The cited sources also provide illustrations of the problems which must be resolved by the commander of such a force.

Merrill's Marauders, 5307th Provisional Regiment-Burma, 1944

The 5307th Provisional Regiment was organized in India in late 1943, simultaneously with the organization of several similar brigades being formed by General Orde Wingate as part of the special force to be used inside Burma. The 5307th regiment consisted of 3,000 men and 700 animals. Of the animals, 360 were mules from the United States and 340 were horses from Australia. The latter were in poor condition at the time the march into Burma began.

The objective given the 5307th regiment was the clearing of the Japanese from an area approximately the size of Connecticut, in order that the so-called Ledo Road could be built. The animals with the regiment were used to carry the heavy weapons, radios, ammunition, and surgical equipment. Feed for the animals, as well as rations for the troops and other equipment were delivered by air-drop during the march.

It was found that the deficiency in training of the men handling the animals constituted a serious handicap to the unit. Although it met with considerable success in its early operations, as the unit penetrated deeper into Burma both troops and animals became tired. One participant in the march has noted, "the battle of the mules was unending and, I think, took more out of the men than anything else, more even than fighting the enemy and fighting disease. When the mules slipped and fell, which they did continually under their heavy loads, there was, as always, the mu-

killing labor of getting them unloaded, staggering up the hills with the components of the cargo, and reloading them. The worst of it was when the mules, losing their footing, would topple off the trail altogether and go head-over-heels down the mountainside, breaking their necks or stabbing themselves with bamboo."*

At the end of the march, nearly all the horses and 120 of the mules had died. The loss of some of the latter was due to enemy action.

Feed for the animals consisted of 8 to 10 pounds of a half-and-half mix of barley and chick-peas per animal per day. Green forage consisted mostly of bamboo leaves, of which both mules and horses ate willingly. Each horse carried 150 to 200 pounds and each mule from 200 to 250 pounds of cargo.

The U.S. Army Philips cargo saddle was used for the mules and the "China Special" for horses. The latter was unsatisfactory as it was too small and did not fit. The Philips cargo saddle was too heavy, although it was suitable in all other respects.

Of the terrain crossed, steep mountains proved to be almost impassable. This was particularly true in wet weather when the trails became slippery.

Sources:

1. Ogburn, Charlton, Jr. The Marauders. New York: Harper and Brothers, 1956.

2. "Jungle Pack Operations," Cavalry Journal, (January-February 1946), 19-22.

3. American Forces in Action. Merrill's Marauders. Department of the Army, Washington: Government Printing Office, 1949.

*Ogburn, Charlton, Jr. The Marauders. New York: Harper and Brothers, 1956, p. 230-231.

Mars Task Force--Burma, 1944-1945

This historical case study is cited to illustrate the improved utility of animal transport for a jungle task force under the command of an officer having access to the experience of other expeditions in similar situations. The sources have a wealth of detail on the solutions to the problems of fitting out a force of this type.

Mars Task Force--Burma 1944-1945

The Mars Task Force was formed in Northern Burma in September 1944. It consisted of two regiments--the 475th Infantry and 124th Cavalry. Also attached were the 612th and 613th Field Artillery battalions, the 44th and 49th Portable Surgical Hospitals, and the 31st, 33rd, 35th, 252nd and 233rd Quartermaster Pack Troops. The total strength of the Mars Brigade was approximately 6,200 men. Each pack troop had between 200 and 300 mules. In addition, each field artillery battalion had about 350 mules. Altogether over 2,000 mules accompanied the unit. The Mars force, in order to make more efficient use of the aminals, took advantage of previous experience with mules in Burma. Training in the care and handling of the animals was particularly emphasized, and as a result the Mars force suffered far fewer casualties to their mules than had the Marauders. Nevertheless, marching the mules over the Burmese mountains tested both animals and men to the limit of their endurance.

The mules were used to carry the unit's heavy weapons, mortars, and signal aid equipment. It was found that the optimum load per animal was approximately 200 pounds. For a long march 180 pounds was more suitable. The heaviest loads carried by the mules consisted of ten 21-pound cans of small arms ammunition. As in previous campaigns, the unit relied on air-drops for rations and feed for the animals. The latter were free-dropped with few losses. When the opportunity presented

itself, the animals were allowed to graze, and bamboo was found to be an excellent substitute for grass.

Once in action with the Japanese along the old Burma Road, the unit used mules to pack supplies from air-drop zones to the forward elements and to evacuate casualties. The portable hospitals used native ponies, each capable of carrying 80 pounds, to transport their equipment.

Sources:

1. Randolph, John. Marsmen in Burma. Houston: John Randolf, 1946.
2. Thrapp, Dan L. "Mules of Mars," Armored Cavalry Journal, (November-December, 1946), 55-58.

Packing Along the Salween

This case history is illustrative of the utility of indigenous animals and equipment in support of military operations in remote areas. The environmental circumstances encountered in this operation were similar to those which might be anticipated in some Andean regions of South America.

Packing Along the Salween

On the Salween River between Burma and China animals were successfully used in pack trains to supply troops in terrain that varied from 500 feet to 11,000 feet in elevation. The animals used were indigenous Chinese stallions three to eight years old which weighed from 350 to 500 pounds. Each horse carried from 80 to 120 pounds of load. The animals were given 8 to 10 pounds of feed per day and were allowed to forage twice a day. The feed consisted of beans (when they were available), rice, rice straw, and grass. The pack saddle used was an ancient Chinese design consisting of a pad, frame and saddle. This saddle permitted quick removal of the load in emergencies.

Source:

Hatt, Reginald. "Packing Along the Salween", Cavalry Journal, (May-June 1945), 29.

Greek Army Operations Against Communist Guerrillas, 1947-1949

This is possibly a classic example of the magnitude and complexity to which a counterinsurgency operation may be developed. In this instance a full-scale military operation was conducted against insurgents who had developed to the point of holding terrain against the government forces. The cited sources provide valuable observations on the nature of operations required against guerrillas who attempt to hold ground against a regular military force. The influence of animal transport on the combat capabilities of both guerrilla and government forces are discussed in this source.

Greek Army Operations Against Communist Guerrillas, 1947-1949

During the Greek Civil War (1947-49) both the government forces and the insurgents made extensive use of animal support for their operations.

The Greek Army's usage of animals was for support of operations in difficult terrain and in remote regions beyond the all-weather road network. The guerrilla forces' usage of animals was in their main supply routes across the borders with Albania, Bulgaria, and Yugoslavia. The Greek Army's general concept was "trucks to the foothills, mules to the fire-fight!"

The following excerpts from comments by observers highlight the utility of animal transport in counterinsurgency operations in Greece during the 1947-49 period:

> 1. A mountain division was normally reinforced by a cavalry squadron, a machine gun company, engineers and a regiment of mountain artillery. Field divisions were similarly reinforced, except armored cavalry, and field artillery replaced cavalry and mountain artillery.
>
> The basic difference between field and mountain divisions, the strengths of which were about 10,500 and 8,500 respectively, lay in the means provided for their transportation. The field division, of which there were three, was organized for war on the plains. Thus it was equipped with motor transport. The mountain division was provided animal transport. There were four such divisions. The relative availabilities of animal and motor resources and varying operational requirements resulted in many variations from these standards as the war wore on.[1]

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1. Murray, J.C. (Col. USMC). "The Anti-Bandit War," The Marine Corps Gazette, LVIII (April 1954), p. 33.

2. Supply and service elements:

Unlike the guerrillas, the Army was supported by extensive supply and service elements. By virtue of its disposition and its great numerical superiority, the Army controlled all essential routes of communication. This with its resources in motor and animal transport, gave it strategic mobility and staying power which tended to offset the guerrillas' greater tactical mobility. Motor transport had little value in the mountainous country to which the guerrillas normally withdrew to nullify the Army's advantages in transport and heavy weapons. It did, however, enable the Army to maintain larger forces operating in the impassable area. Through its use, resupply could be brought up to a roadhead, whence it could be forwarded by animal transport. The guerrilla, by contrast, had to get along with the supplies he carried with him as he withdrew to the hills, plus whatever he could gather off the country or move in by a long, slow and inadequate system of animal transport.[2]

3. The requirement for transport probably varied between one and two pounds per day for each guerrilla operating in south and central Greece. This seems insignificant, but neither the supplies nor their quantity were insignificant. Without these supplies, which could not be obtained locally, the guerrillas could not function effectively. They were vital, therefore, to guerrilla operations.

Five thousand guerrillas in south and central Greece would have used 50 to 100 animal loads daily. Taking 120 miles as the average distance from the base areas to the users, the turn-around time was in the neighborhood of two weeks. Thus, 700 to 1,400 animals would have been employed constantly in this traffic, even if no allowance is made for losses in transit. These were actually quite high. Mule trains were intercepted frequently by the Air Force or Army units and damaged or destroyed.

The problems involved in organizing the routing and protection of the supply trains moving between the base areas and the bands in central and southern Greece were many. They were greatest when the Army was active. During such times the bandits were expending more supplies than normally. They were forced to abandon stores which could not be carried. They were unable to requisition supplies in areas through which they might be passing, as this took time and provided information to the Army. Similarly, raids upon towns or Army stores were impracticable. Finally, the mule trains from the north had greater difficulty in getting through, and not infrequently the bands were unable to keep their rendezvous with such trains.[3]

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2. Ibid., p. 54
3. Ibid., p. 59.

4. As regards the distribution of supplies, the Army had been handicapped prior to the inception of the U.S. aid program by shortages in motor transport. When the shortages were made up it was discovered that too much reliance had been placed upon motors and that there was a greater requirement for animal transport. One U.S. mission assisted in the organization and training of animal transport and in the summer of 1948 placed orders for 4,000 mules. In June 1949 all infantry battalions were placed on the mountain unit establishment and all vehicles were withdrawn to the brigade motor transport platoon. Supplementing the animals organic to the units, 12 mule transport companies were organized. While the changes in the organization of transport increased the flexibility of the Army in its anti-guerrilla warfare, it would scarcely be necessary to take the view that the Army had previously been handicapped in its operations by inadequate means for the transportation and distribution of supplies.[4]

Greek Army experience as reported by Col. Murray indicates that its system of support was generally adequate. Guerrillas managed to survive on their limited resources until political considerations induced them to hold ground. Lacking heavy weapons and with limited ammunition supplies, the guerrillas were unable to hold terrain against the Army.

There were no apparent problems involved in the use of animals. Even non-acclimated United States animals were effective.

Source:

Murray, J.C. (Col. USMC) "The Anti-Bandit War," The Marine Corps Gazette, LVIII (April 1954).

[4] Ibid., p.60.

Appendix B

Professional Opinions of Military Officers

(1) Argentina - Colonel Fernando Dubra
(2) Brazil - Colonel Newton Mello
(3) The Dominican Republic - Colonel Braulio Alvarez and Colonel Jose DeLeon
(4) Uruguay - Colonel Carlos Vidal
(5) The Philippines - General Alfredo Santos and General Ismael Lapuz

Professional Opinion--Argentine

Interviewee: Colonel Fernando Dubra, Cavalry, Argentine Army, student at the Inter-American Defense College, Fort McNair

Interviewer: Hartley F. Dame, SORO

Date of Interview: 14 April 1965

Colonel Dubra stated that there are two basic reasons for retention of animals in the Argentine military establishment, viz., economics and environment. In elaboration, he explained that there was as yet no economic justification for the construction of the requisite road net and airports to provide year-round access to all sectors of the country, neither did there exist the economic demand to support automotive and aircraft industries to provide motor vehicles and aircraft within Argentine resources. Since large areas of Argentina are sparsely settled and the residents of these regions normally depend upon animals for transportation, the animal-breeding industry is well developed; thus national resources produce suitable animals and equipment. Experienced personnel are readily available to employ them.

Commenting on Argentine experience, Colonel Dubra cited the peculiar conditions in three regions which had resulted in the development of specialized breeds of animals for use in these regions.

> Salta: This region in northwest Argentina is in the low-lying foothills of the Andes. Terrain is rough, soils are generally poor and there are saline deserts and thick scrub forests. Native pastures and grains are sparse. The customary animal for mounts and pack use is the "bush pony," which is adapted to survival in the regional environment.

Corrientes: This region in northeast Argentina is a low-lying marshy region. The horse used in this region is a small animal whose feet are resistant to water immersion, and which has developed an immunity to ticks, flies, and mosquitos. Animals indigenous to this region are sure-footed and sensitive to soft ground.

Mendoza: This region is high in the Andean Cordillera. While horses are the favorite mount, only those bred and raised at those altitudes are serviceable as military animals. Mules are normally used as pack animals at high altitudes. Selected mules may also be used as mounts.

Even though rail and highway routes exist between Mendoza in Argentina and Santiago in Chile, both are subject to long periods of interuption in the winter. Operations off the road/railroad in the Andes are still subject to the influences of the climate and terrain which were encountered by San Martin more than a century ago. The experience of San Martin, who used lowland animals in his crossing of the Andes in 1817, is described by Ricardo Rojas in El Santo de la Espada.* 7

The Army does not use burros and llamas as pack animals, although civilians occasionally do so.

It is the opinion of Colonel Dubra that insurgents operating in Argentina would be forced to rely upon animals for transportation. The counter-insurgency forces would be severely handicapped and road-bound unless they also used animal transport.

Additional material on military animals in Argentina can be obtained from the Comando General de Remonta y Veterinaria, Calle Callao 860, Buenos Aires, Argentina.

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*"The difficulty that had to be overcome in the crossing of the mountains can only be imagined by those who have actually gone through it. The chief difficulties were the lack of population and roads, the lack of game, and especially of pastures. The army had 10,600 saddle and pack mules, 1,600 horses, and 700 head of cattle, and despite the most

scrupulous care there arrived in Chile only 4,300 mules and 511 horses in very bad condition. The rest either died or were rendered useless during the crossing of the mountains. Two six-inch howitzers and ten four-inch field pieces, which went through Uspallata, were transported by 500 (sic) wheeled carriages, although a great part of the way they had to be carried by hand, with the help of block and tackle, when reaching the higher peaks. Food supplies for the twenty days the march was to last were taken on mule-back, inasmuch as there was no house or town between Mendoza and Chile by way of Uspallata, and five mountain ranges had to be crossed. The greater part of the army suffered from lack of oxygen, as a result of which several soldiers died, besides others who succumbed to the intense cold. Everyone was convinced that the obstacles which had been overcome did not leave the slightest hope for a retreat; but, on the other hand, there reigned a great confidence among the ranks, which carried out their tasks heroically, in the midst of keen rivalry among the different units." (Ricardo Rojas. El Santo de la Espada, Buenos Aires: Editorial Losada; 1940. Translated by Herschel Brickell and Carlos Videla, as San Martin, Knight of the Andes; copyright 1945 by Doubleday & Company, Inc.; 108.)

Professional Opinion - Brazilian

Interviewee: Colonel Newton Mello, Brazilian Army Attache, Washington, D. C.

Interviewer: Curtin Winsor, Jr., SORO

Date of Interview: 22 April 1965

In Brazil the military establishment continues to maintain and utilize animal-mounted cavalry units. The rationale for the use of this kind of unit, as explained by Colonel Mello, consists of a mixture of environmental, economic, and tactical factors.

Environmental Factors:

Brazil uses its cavalry divisions in the region which borders on Paraguay and Uruguay. The gently rolling terrain is not well opened up by roads and, being cattle country, is suitable for horse-mounted anti-smuggling operations. The Brazilian cavalry is apparently operationally limited to these southern plains or prairies.

One reason for the continued use of horse cavalry is the traditional reliance of the inhabitants of these areas on horse transportation. The horse has been the customary method of transportation in this region of Brazil, and cavalry recruits often bring their own horses into the military service with them.

Economic Factors.

Colonel Mello pointed out that reliance upon animal transport in some

areas is further justified by several economic considerations. Road networks are insufficient in these areas and the building of such networks would be financially infeasible. Brazil suffers from a chronic shortage of petroleum, which would make the fueling of motorized units prohibitively expensive and difficult, due to the distances involved in transporting fuel. Another factor is the expense of using motorized units in areas where supply depots, spare parts, repair facilities, and driver training present problems.

Tactical Factors:

Colonel Mello explained that cavalry is used in the south of Brazil for some negative reasons as well as for positive ones. It would appear that horse cavalry is useless in the jungle regions due to a lack of forage and, as Colonel Mello pointed out, there are no insurgents in the jungles. In addition, most of the other areas of Brazil which are vulnerable to insurgents are either served by road nets, or they are well suited to paratroop operations which cut the time element out of the old methods of riding down the insurgent bands. Apparently Brazilian strategy has been to locate bands with observation planes and then use parachutists against them. Animal-mounted cavalry has not seen much counter-insurgency usage in Brazil.

Professional Opinion - Dominican Republic

Interviewees: Colonel Braulio Alvarez, Colonel Jose DeLeon, students at the Inter-American Defense College, Fort McNair

Interviewer: Hartley F. Dame, SORO

Date of Interview: 16 April 1965

Colonel DeLeon was the principal spokesman for the two men. Concerning the continued utility of animal-mounted units in the Dominican Republic, he made the following comments: "During the reorganization of the Army after the assassination of Trujillo, animal units were replaced by motorized units. During the 1963-1964 disputes with Haiti, the Army found that motorized patrols in the mountains and along the Haitian border were inadequate for the purpose, due to limited road nets. Foot patrols could not cover the distances involved nor could they carry adequate supplies. Therefore, in early 1964, animal-mounted elements were re-established in those units assigned to internal security missions and border patrols." In answer to questions on problems encountered, he could not recall any, and commented that most Dominican peasants were competent riders and animal handlers. They required very little additional training above their normal military training.

Both Colonel DeLeon and Colonel Alvarez stated that it would be many years before the Dominican Republic could do without animal-mounted or animal-supported internal security units.

Professional Opinion--Uruguayan

Interviewee: Colonel Carlos Vidal, Uruguayan Army, student at the Inter-American Defense College, Fort McNair

Interviewer: Hartley F. Dame, SORO

Date of Interview: 16 April 1965

Colonel Vidal, who has served with the Guardia Republicana (the Uruguayan gendarmerie which is charged with rural public security), tends to equate the problems of counterinsurgency operations with those he has experienced in anti-smuggling operations. Especially along the Uruguay/Brazil border, smugglers operate in small, well-organized bands. The Guardia, operating from a few base stations, depends upon mounted patrols to prevent smuggler infiltrations along the sparsely settled frontier region.

According to Colonel Vidal, the few motor roads in the region can be bypassed by pack trails. The brush and the savannah grass make aerial patrols ineffective. Therefore, horse-mounted patrols are the only effective means of maintaining adequate surveillance of infiltration routes. It is Colonel Vidal's opinion that animal-mounted units supported by pack trains would be indispensable in dealing with any insurgent operations in Uruguay. It is also his opinion that economically the most logical composition of forces should be approximately 50 percent animal-transported and 50 percent motorized elements. He pointed out that animals and trained riders and packers are readily available throughout the interior of Uruguay. Similarly, because most campesinos utilize animals, fodder and forage are

available throughout wide areas. Horses are preferred for mounts and mules for packs. Both are readily adaptable to the climate and the terrain.

It is Colonel Vidal's opinion that, because of the limited road network and the high cost of cross-country motor vehicles, there will be a continuing requirement for the use of animals in the Uruguayan Army for many years.

* *

The following extracts from an AID survey of the Guardia Republicana support Colonel Vidal's statements:

> 1. In the Department bordering on the Brazilian frontier there is a "frontier zone" which averages some 7-10 miles in depth. The movement of cattle, sheep, hides, wool, etc. within this zone requires a permit specifying numbers, brands, destinations and purpose. Since there are few highways and these are controlled with checkposts, it would appear difficult to move goods away from the border area without some collusion. The relatively sparsely populated border areas are ideal for smuggling. The police report that contraband is illegally transported, particularly during the night hours with the use of horse pack trains.[1]
>
> 2. Particularly in rural areas the patrol function is carried out by police on horseback.[2]
>
> 3. In Montevideo, riot control is the basic responsibility of the Republican and Metropolitan Guards. The Republican Guard is a mounted unit with a total effective field strength of 300 horses and men. Its basic weapon is the sabre. It is used to disperse a crowd if the foot forces of the Metropolitan Guard have proved ineffective.[3]
>
> 4. The Republican Guard has no motorized transport for horses and can reach the scene of a disturbance no faster than the time required for the trip on horseback. When considerable distances are involved, both men and horses may be too fatigued for any sustained action.[4]

---

[1] "AID Survey of the Internal Security Forces of Uruguay," (unpublished paper, 1963), p. 22.

[2] Ibid., p. 24.

[3] Ibid.

[4] Ibid.

Officers and troopers of the Guardia Republicana receive training in horsemanship and in the care of animals throughout their two years of instruction.

Professional Opinion - Philippine

Interviewees: General Alfredo Santos, Chief of Staff of the Philippine Armed Forces; and General Ismael Lapuz, Commanding General, Philippine Army

Interviewer: Aubrey E. Lippincott, SORO

Date of Interview: 23 April 1965

Generals Santos and Lapuz stated that at the time of the formation of the Commonwealth in 1936 provision was made to use pack horses as organic transport for machine-gun units in the Philippine Army.

The officers stated that in guerrilla campaigns against the Japanese, carabaos and small native horses were used as pack animals. The horses were extremely useful as they knew the land and paths well, and feeding was no problem. The horses, in fact, knew the trail so well that they were allowed to make their way unguided through the jungle. These animals were used to carry both men and provisions. Mules were also used as pack animals in campaigning against Japanese forces in the Islands. On one occasion, when the Filipino forces were completely cut off from their supplies, the men were forced to kill and eat their mules. Had it not been for this source of food supply these troops would have starved to death.

General Santos said that in the post-war campaign against the Huk guerrillas, ponies, carabaos, and some horse cavalry were used. Animal transportation was, however, not so vital as in the war against Japan because the area of operations against the Huks was confined largely to the

well-roaded central plains of Luzon. However, there were instances in the campaign when, because of a shortage of pack animals, men had to be used as pack carriers even though they were also badly needed as combat troops.

The officers stated that at the present time, because of budgetary considerations, cavalry and pack animals do not form a part of the Philippine Army.

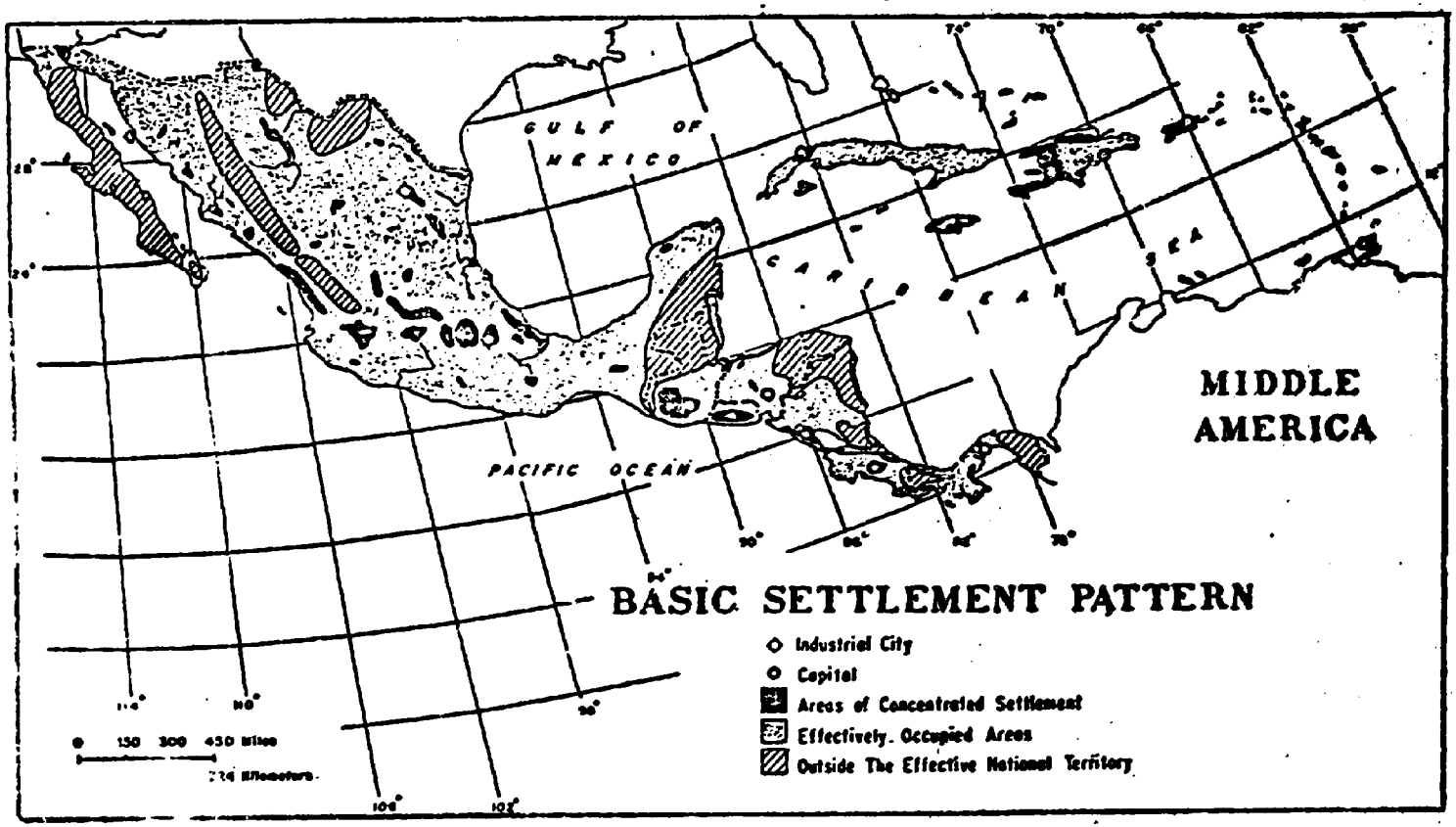
Both officers expressed the opinion that horse cavalry and pack animals are necessary today for the accomplishment of military objectives in certain types of terrain--i.e., mountainous, swampy jungle, etc.--in insurgency and counterinsurgency situations. In operations in underdeveloped countries and in wild terrain it is necessary to use trails which can be negotiated only by animals or by men. The officers stated emphatically that they felt there would always be a need for animals in certain military situations.

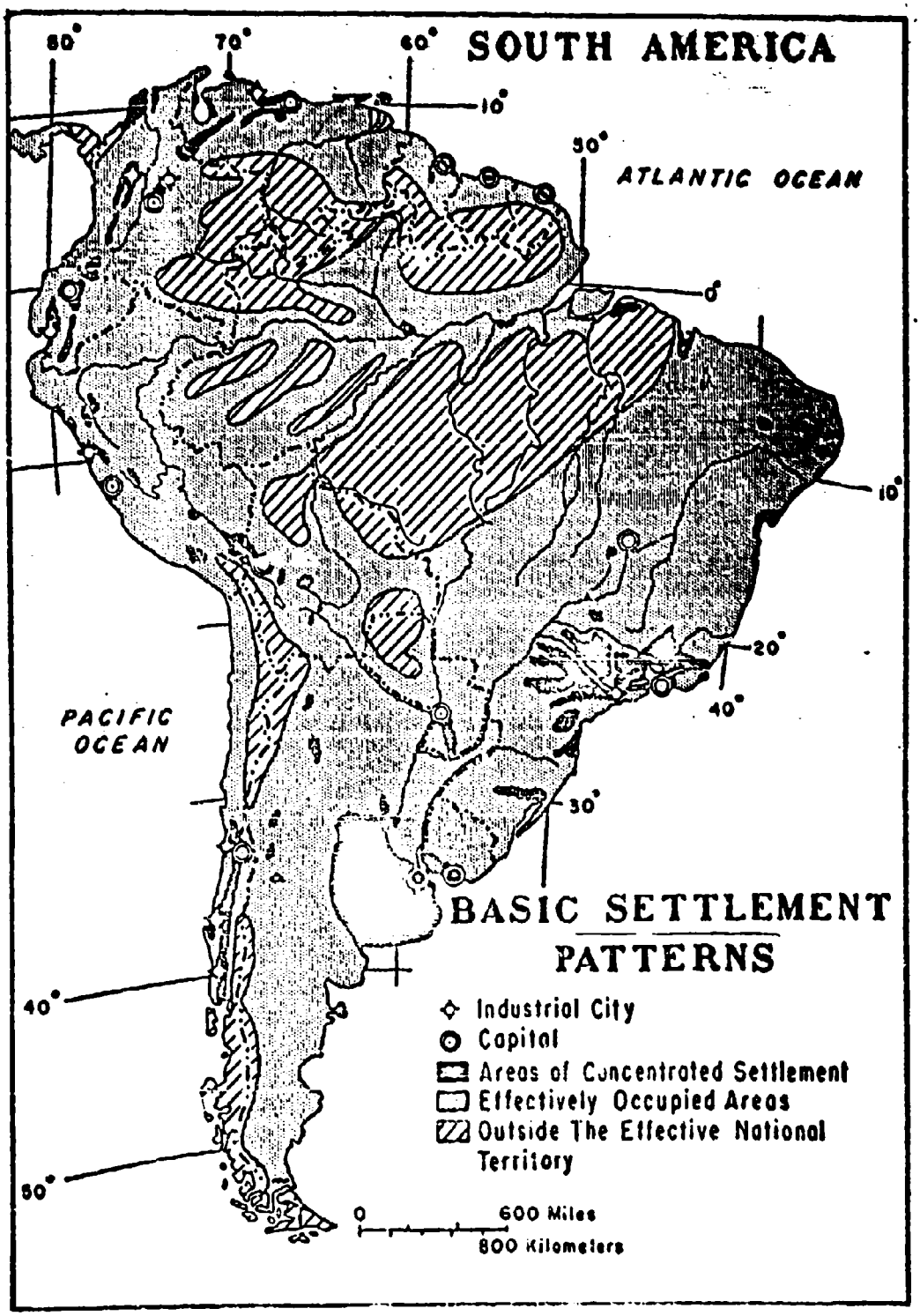
Appendix C

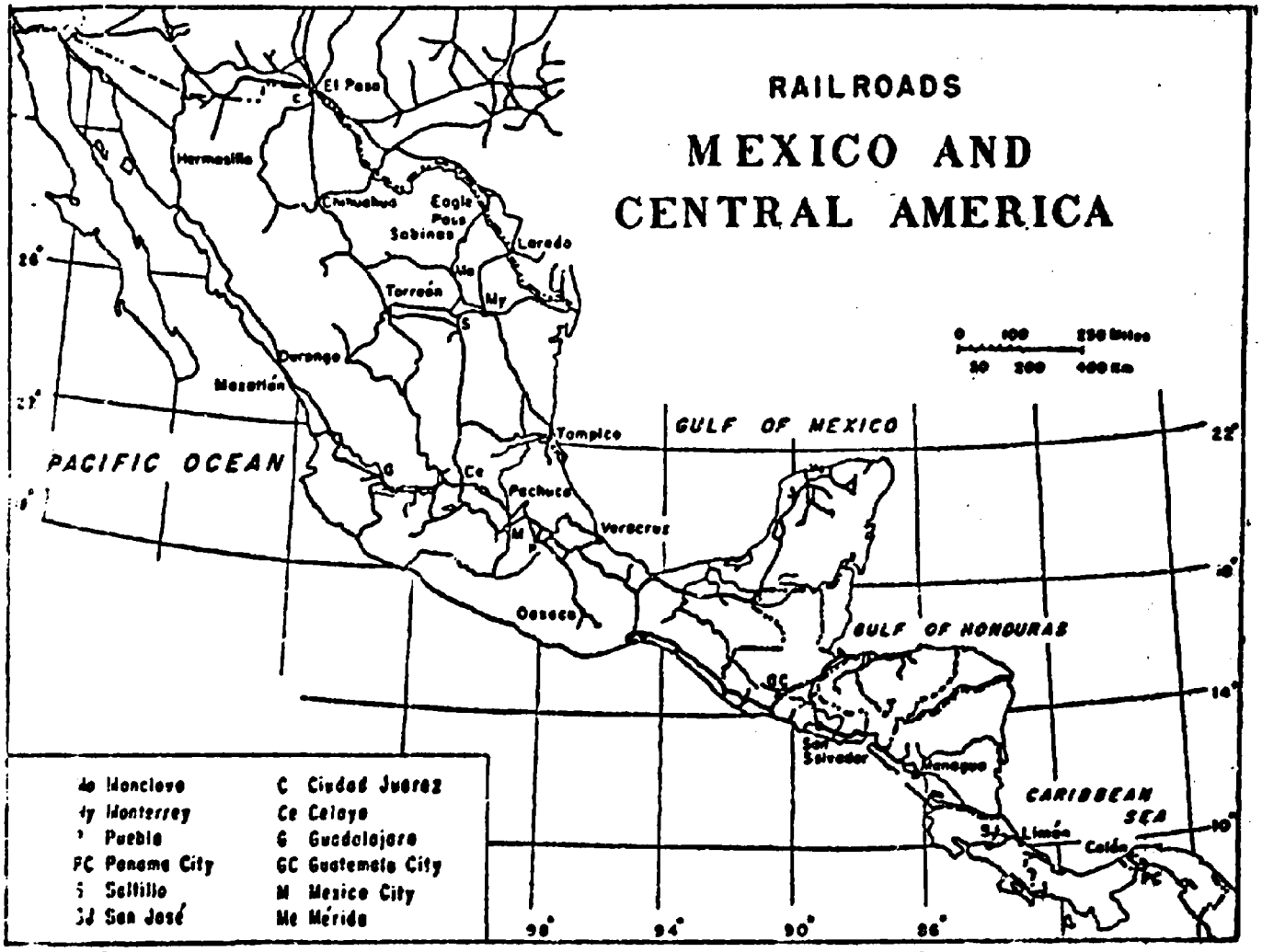
Maps and Statistics on Environmental Factors in Latin America

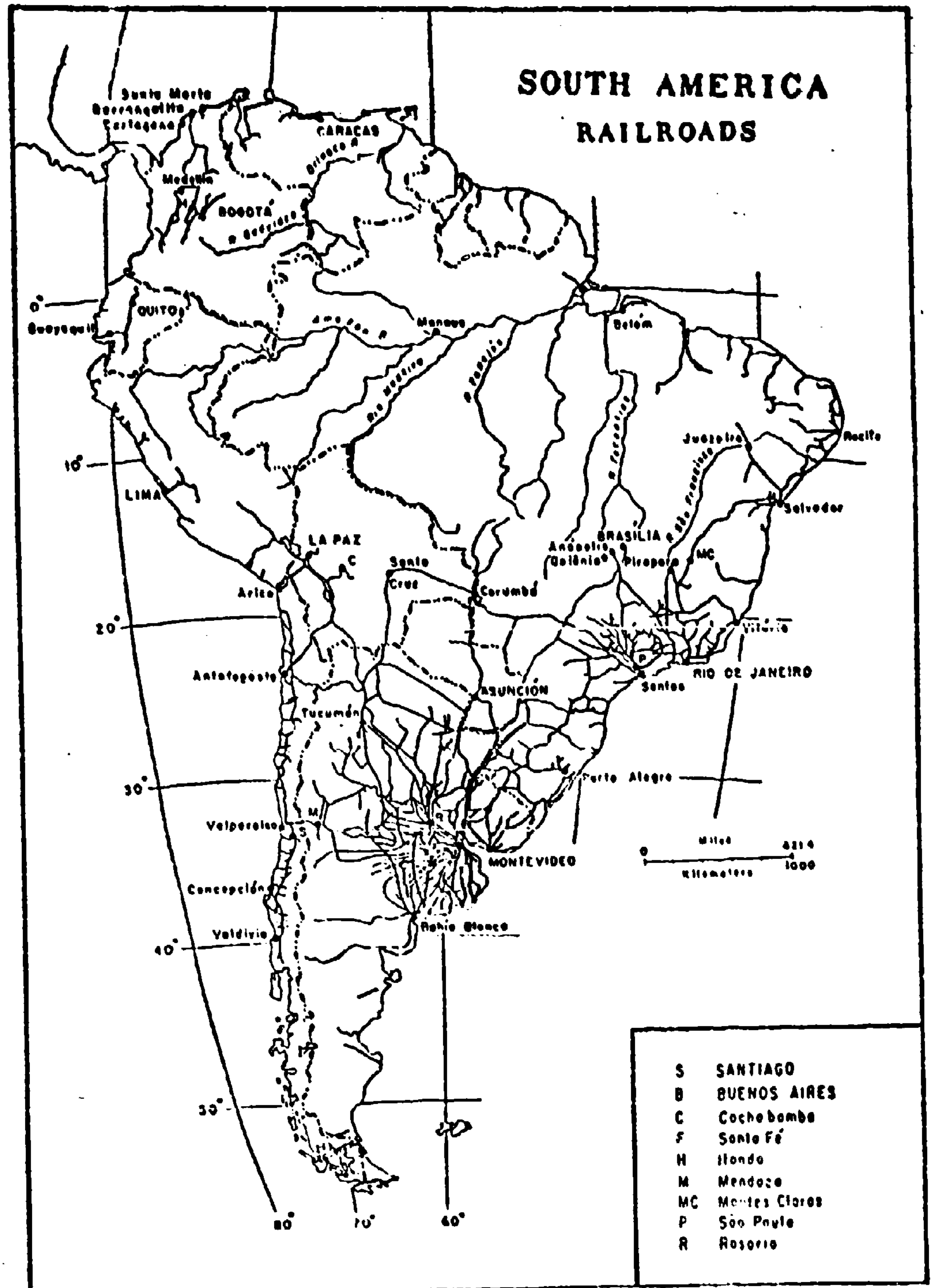
(1) Physical Relief Map, South America
(2) Settlement Patterns
    (a) Middle America
    (b) South America
(3) Railroad Network
    (a) Middle America
    (b) South America
    (c) Railroad Statistics
(4) Navigable Waterways, South America
(5) Motor Vehicle Statistics
(6) Equine Animal Statistics


Willemstad
Barranquilla
Caracas
Port-of-Spain
Colon
Panama
Maracaibo
Cucuta
ORINOCO
ATLANTIC OCEAN
Georgetown
Paramaribo
Medellin
Cayenne
Bogota
Cali
Quito
NEGRO
Belem
Manaus
Guayaquil
AMAZON
Iquitos
Fortaleza
Natal
Trujillo
Recife
Lima
SAO FRANCISCO
Salvador
La Paz
Arequippa
Sucre
Belo Horizonte
Sao Paulo
Rio de Janeiro
Antofagasta
Santos
Asuncion
PACIFIC OCEAN
Tucuman
Porto Alegre
Cordoba
Rosario
Valparaiso
Montevideo
Santiago
Buenos Aires
ATLANTIC OCEAN
Concepcion
Bahia Blanca
Mar del Plata
Puerto Montt
Comodoro Rivadavia
Punta Arenas


GULF OF MEXICO
CARIBBEAN SEA
PACIFIC OCEAN
MIDDLE AMERICA
BASIC SETTLEMENT PATTERN
Industrial City
Capital
Areas of Concentrated Settlement
Effectively Occupied Areas
Outside The Effective National Territory
0 150 300 450 Miles


SOUTH AMERICA
80°
70°
60°
10°
30°
ATLANTIC OCEAN
0°
10°
20°
40°
PACIFIC OCEAN
30°
40°
50°
BASIC SETTLEMENT PATTERNS
Industrial City
Capital
Areas of Concentrated Settlement
Effectively Occupied Areas
Outside The Effective National Territory
0
600 Miles
800 Kilometers


RAILROADS
MEXICO AND
CENTRAL AMERICA
El Paso
Hermosillo
Chihuahua
Eagle Pass
Sabinas
Laredo
Torreón
Durango
Mazatlán
Tampico
GULF OF MEXICO
PACIFIC OCEAN
Pachuca
Veracruz
Oaxaca
GULF OF HONDURAS
San Salvador
CARIBBEAN SEA
Limón
Colón
26°
22°
18°
14°
10°
98°
94°
90°
86°
Mo Monclova
My Monterrey
P Puebla
PC Panama City
S Saltillo
SJ San José
C Ciudad Juarez
Ce Celaya
G Guadalajara
GC Guatemala City
M Mexico City
Me Mérida


SOUTH AMERICA
RAILROADS
Santa Marta
Barranquilla
Cartagena
CARACAS
Medellín
BOGOTÁ
QUITO
Guayaquil
Manaus
Belém
Recife
LIMA
Salvador
LA PAZ
Santa Cruz
Corumbá
BRASILIA
Anápolis
Goiânia
Pirapora
MC
Arica
Vitória
Antofagasta
ASUNCIÓN
RIO DE JANEIRO
Santos
Tucumán
Porto Alegre
Valparaíso
MONTEVIDEO
Concepción
Bahía Blanca
Valdivia
0°
10°
20°
30°
40°
50°
80°
70°
60°
Miles
Kilometers
1000
S SANTIAGO
B BUENOS AIRES
C Cochabamba
F Santa Fé
H Hondo
M Mendoza
P São Paulo
R Rosario

	REGION AND COUNTRY	OPERATING RAILWAYS[1] ROUTE LENGTH 1958-1959[A1]						DENSITY[B1]		RAILWAY TRAFFIC[B]				
		Total		Percent Distribution, by Gauges[B]							PASSENGERS[B2]		FREIGHT[B]	
		Kilometers	Miles[B]	1.676 m (5' 6")	1.435m (4' 8.5")	1.000 m (3' 3.375")	0.750m (2' 5.5")	0.600m (1' 11.625")	Km. per Thous Km² Area	Mi. per Thous mi² Area	Date	Million Passenger Kilometers	Million Passenger Miles[B]	Million Net Ton Kilometers	Million Net Tons[B]
1	WORLD TOTAL	...	...	...	...	...	...	...	...	...	1960	...	...	[C]2,185,000	[C]2,148,563
2	UNITED STATES	[D]380,635	[D]236,515	—	99.9	[E]0.1	—	—	40.7	65.4	1960	[F]35,500	[F]22,059	[C]835,486	[C]823,306
3	CANADA	[D]76,193	47,344	—	98.3	[E]1.7	—	—	7.6	12.3	1959	3,939	2,465	98,947	64,797
4	LATIN AMERICA REGIONAL TOTAL[B]	[H]142,102	88,298	...	...	...	...	...	4.9	11.1	...	...	...	...	...
	LATIN AMERICAN REPUBLICS														
5	MEXICO	20,535	12,760	—	92.9	[E]7.0	[D]0.1	—	10.4	16.8	1959[A4]	5,662	3,375	12,210	8,363
6	COSTA RICA	[D]1,118	[D]673	—	—	[E]100.0	—	—	22.1	24.2	1959	[H]36	22	50	36
7	EL SALVADOR	620	385	—	—	[E]100.0	—	—	29.3	47.2	...	...	...	...	...
8	GUATEMALA	[H]1,151	[H]715	—	—	[E]100.0	—	—	10.6	17.0	1959	...	...	[H]266	160
9	HONDURAS	573	356	—	—	[E]100.0	—	—	5.1	8.2	...	...	...	...	...
10	NICARAGUA	347	216	—	—	[E]100.0	—	—	2.3	3.8	1959	77	48	32	22
11	PANAMA	[H]591	[D]367	[D]13.9	—	86.1	—	—	7.9	12.8	...	...	...	...	...
12	Total, Central American Republics[B]	[H]4,400	2,734	...	...	...	...	...	8.9	13.7	...	...	...	...	...
13	CUBA	[H]5,718	[H]3,553	—	85.1	[E]11.5	[H]1.4	2.0	49.9	80.4	1957[A7]	[D]278	173	1,183	796
14	DOMINICAN REPUBLIC	710	441	—	91.3	[E]16.3	[D]28.3	—	14.6	23.4	...	...	...	...	...
15	HAITI	301	187	—	—	[H]99.8	[D]49.3	—	10.8	17.9	...	...	...	...	...
16	Total, Antillean Republics[B]	[H]6,729	4,181	...	...	...	...	...	33.2	86.7	...	...	...	...	...
17	ARGENTINA	44,692	27,776	95.5	7.7	34.8	1.9	—	16.1	25.9	1959	16,964	10,542	18,526	18,634
18	BOLIVIA	3,286	2,042	—	—	99.0	[H]1.0	—	3.0	4.8	1957[A6]	236	147	264	199
19	BRAZIL	19,479	24,531	[H]9.0	—	88.8	[H]1.9	[H]0.3	4.6	7.5	1958	13,432	8,346	[H]11,128	[H]7,621
20	CHILE	[H]9,043	[H]5,619	35.4	7.8	[H]52.8	[H]2.4	2.7	12.2	19.6	1959[A6]	2,487	1,495	[H]2,220	[H]1,523
21	COLOMBIA	[H]3,151	[H]1,956	—	—	[H]100.0	—	—	2.8	4.5	1959	651	405	[H]702	[H]538
22	ECUADOR	1,120	696	—	—	86.2	13.8	—	4.1	6.7	1956	113	70	106	73
23	PARAGUAY	1,062	660	—	47.3	8.9	[H]43.1	[H]1.7	2.6	4.2	1959	31	19	18	12
24	PERU	3,668	2,262	—	63.2	[H]29.6	[H]2.7	[H]4.4	2.8	4.6	1959	259	161	[H]301	[H]349
25	URUGUAY	[H]3,982	[H]1,672	—	100.0	—	—	—	10.0	25.9	...	...	...	...	...
26	VENEZUELA	525	326	—	27.6	[H]55.2	[D]10.7	6.6	0.6	0.9	1959	21	13	13	9
27	Total, South American Republics[B]	[H]100,980	67,717	...	...	...	...	...	6.3	10.1	...	...	...	...	...
28	Total, Latin American Republics[B]	140,644	87,342	...	...	...	...	...	7.0	11.3	...	...	...	...	...


SOUTH AMERICA
WATERWAYS
&
ALL WEATHER ROADS
Santa Marta
Barranquilla
Cartagena
CARACAS
BOGOTÁ
Orinoco
Guayaquil
QUITO
Amazon
Manaus
Belém
Rio Madeira
Rio Tapajos
Juazeiro
Recife
Salvador
LIMA
LA PAZ
Santa Cruz
Arica
Corumbá
BRASILIA
Anapolis
Goiânia
MC
PI
Vitória
Antofagasta
ASUNCIÓN
RIO DE JANEIRO
Santos
Tucumán
Miles
Kilometers
Santa Fe
Porto Alegre
Valparaiso
Mz
R
MONTEVIDEO
Concepción
Valdivia
Bahia Blanca
Falls
Chief Navigated Rivers
All Weather Roads
P São Paulo
B BUENOS AIRES
S SANTIAGO
C Cochabamba
H Honda
M Medellin
MC Montes Claros
Mz Mendoza
R Rosario
PI Piracpora
10°
20°
30°
40°
50°
80°
70°
60°

MOTOR TRANSPORT

	REGION AND COUNTRY	MOTOR VEHICLES IN USE[8] — Date	Passenger Vehicles (Thousands)	Commercial Vehicles (Thousands)	Vehicles per Thousand Persons[9]	MOTOR TRANSPORTATION — ROAD NETWORK 1954 CIRCA[10] — Total: Kilometers[11]	Total: Miles	Per Cent Improved[12]	Density: Km. per Thous. Sq. Km.	Density: Mi. per Thous. Sq. Mi.	
1	WORLD TOTAL	1959[6]	91,230	23,790	40	...	...	...	...	...	1
2	UNITED STATES	1959[7,8]	59,567.0	11,936.0	402	5,500,748	3,418,000	[14]66.5	703	1,131	2
3	CANADA	1959[6]	3,774.2	[9]1,158.4	285	843,386	524,055	[14]36.8	85	136	3
4	LATIN AMERICA: REGIONAL TOTAL	.	...	...	...	...	...	...	...	...	4
	LATIN AMERICAN REPUBLICS										
5	MEXICO	1959[7]	435.1	321.6	23	166,294	117,000	24.7	96	154	5
6	COSTA RICA	1959	19.2	10.4	26	7,498	4,659	30.0	147	237	6
7	EL SALVADOR	1959	18.8	6.9	7	6,310	3,921	49.0	316	508	7
8	GUATEMALA	1958	22.2	11.9	9	13,637	8,100	81.7	120	193	8
9	HONDURAS	1959	5.4	5.8	6	1,505	935	82.6	14	22	9
10	NICARAGUA	1959[10]	8.5	4.8	9	7,564	4,700	10.6	51	82	10
11	PANAMA	1959[11]	14.9	7.9	22	2,227	1,384	61.9	30	48	11
12	Total, Central American Repubs.	.	...	...	...	38,142	23,700	49.0	74	119	12
13	CUBA	1958	159.2	51.3	22	[13]5,473	[13]2,158	[13]100.0	30	49	13
14	DOMINICAN REPUBLIC	1959[10]	10.8	6.5	4	[13]3,246	[13]2,017	[13]81.1	66	107	14
15	HAITI	1958	————	9.9	————	[13]2,997	[13]1,862	[13]97.3	108	174	15
16	Total, Antillean Repubs.	.	...	...	...	[13]9,056	[13]6,000	[13]93.6	50	81	16
17	ARGENTINA	1958	387.8	323.4	35	143,377	89,090	38.6	52	83	17
18	BOLIVIA	1958[6]	11.6	24.0	11	14,693	9,130	6.8	14	22	18
19	BRAZIL	1958	486.9	331.8	15	306,259	190,300	30.1	36	58	19
20	CHILE	1959	61.4	73.9	16	48,635	30,202	90.1	65	105	20
21	COLOMBIA	1953[10]	83.8	74.5	12	17,185	10,678	44.7	15	24	21
22	ECUADOR	1953	7.3	16.5	6	9,603	5,967	55.8	35	57	22
23	PARAGUAY	1959[6]	4.8	1.6	4	7,403	4,600	10.2	18	29	23
24	PERU	1957	64.6	54.5	12	35,864	22,285	66.1	28	45	24
25	URUGUAY	1956	52.3	[14]48.0	37	10,206	6,342	97.8	59	88	25
26	VENEZUELA	1958	186.0	86.1	43	17,178	10,674	57.8	19	30	26
27	Total, South American Repubs.	.	...	...	...	610,425	379,300	40.6	35	57	27
28	Total, Latin American Repubs.	.	...	...	...	864,517	526,000	38.0	42	68	28

9 Includes military vehicles, trolley-buses in two provinces only, ambulances, hearses, and special purpose vehicles.

10 Excludes government vehicles.

11 Excludes government vehicles and vehicles from the Canal Zone.

12 Includes vehicles operated by police or other government security organizations, military vehicles, ambulances, hearses, and trolley-buses. (Ambulances, hearses, and trolley-buses are included as commercial vehicles).

13 Data for all independent states, with the exception of Canada, are from Source C. For Canada and for the dependencies, entries were compiled from Statesman's Year-book 1957. Although more recent data are available from later editions of the Statesman's Year-book, older data have been retained in order to furnish a uniform 1956-55 time base for all entries.

Under "Total" are included roads suitable for transit by motor vehicles. Some countries consider "trails" as part of the road system, but as far as possible trail mileage has been excluded from the table.

Under "Improved" are represented paved or surfaced roads and unpaved but drained and graded roads.

Under "Density" is shown the ratio of length of a country's road network to the country's area.

14 Surfaced roads only.

15 Total road mileage probably incomplete. Source C seems to have reported data limited largely to "improved" roads; viz. figure of "100% improved" for Cuba. Entries in Column 15 may still be a fairly accurate indication of extent of "Improved Roads" (as percentage of figure in Column 13 or 14), even though entries in Columns 13 and 14 do not represent the entire length of the road network.

EQUINE ANIMAL STATISTICS

	REGION AND COUNTRY	EQUINES[A]			
		Date	Horses	Mules	Asses
1	WORLD TOTAL[1]	58/59 F	70,300	15,900	39,800
2	UNITED STATES	59/60 F	2,130	958	...
3	CANADA	59/60 F	574	...	...
4	LATIN AMERICA: REGIONAL TOTAL	58/59	24,000	8,200	7,700
	LATIN AMERICAN REPUBLICS				
5	MEXICO	58/59	5,228	2,698	3,207
6	COSTA RICA	54/55	80	7	...
7	EL SALVADOR	57/58	121	27	2
8	GUATEMALA	59/60 F	161	54	8
9	HONDURAS	55/56	192	86	22
10	NICARAGUA	50-52	150	41	21
11	PANAMA	49/50	158	5	...
12	Total, Central American Republics	.	...	...	...
13	CUBA	50-52	410	32	4
14	DOMINICAN REPUBLIC	59/60 F	241	84	142
15	HAITI	58/59	255	56	163
16	Total, Antillean Republics	.	...	...	...
17	ARGENTINA	58/59 F	4,506	...	...
18	BOLIVIA	50/51	157	54	411
19	BRAZIL	59/60 F	8,333	4,047	2,031
20	CHILE	58/59	555	...	...
21	COLOMBIA	56/57	1,331	492	353
22	ECUADOR	49-52	106	46	41
23	PARAGUAY	58/59 F	292	8	18
24	PERU	59/60 F	567	189	426
25	URUGUAY	55/56	557	...	...
26	VENEZUELA	56/57	[illegible]	130	427
27	Total, South American Republics	.		...	...
28	Total, Latin American Republics	.		...	...

A -Figures are for 1,000 units

Appendix D

Miscellaneous Illustrative Material

Appendix D

Miscellaneous Illustrative Material

(1) The following information concerning animals utilized in World War II has appeared in The Cavalry Journal.

(a) Air Transportation of Animals

In April 1945, in order to reinforce central China, 25,136 men of the Chinese Army and 2,178 horses and mules were flown to the area from Burma. The movement was accomplished without loss of men or animals. Each C-47 carried two horses and 2 mules plus handlers and forage. Strips of thin planking and plywood were put on the floors and sides of the aircraft to help the animals stand and to keep them from hurting themselves on the metal parts of the aircraft.[1]

(b) Overland Herding of Mules

In May 1945, nine hundred mules were herded from Burma to China across the newly constructed Burma Road. The distance covered was 750 miles. The mules moved in batches of 300 each, and 240 men were required for the entire march. Experience gained from the march showed that for long-distance herding there should be one man for every 4 mules, and 5 trucks for every 300-400 animals. Good forage and a leisurely pace were essential for

1. LaVaue, Arthur. "Pegasus," The Cavalry Journal, (November-December 1945), 48-49.

getting the mules to their destination in a reasonable condition. Two tons of horseshoes were brought along and were barely adequate for the trip.[2]

(c) Japanese Horse Cavalry

Information obtained from China after the war showed that the Japanese Army maintained two brigades of horse cavalry in Manchuria during the war. Each brigade consisted of two regiments and had over 3,000 horses. Cavalry was extensively used for reconnaissance in rough terrain along the Manchurian-Soviet border.[3]

(d) Veterinary Activities in World War II

Veterinary Corps records show that on V-J Day the U.S. Army had on hand 41,600 horses and mules, of which 17,000 were overseas. The peak number of horses and mules on inventory during World War II was 60,170 on December 31, 1943. In addition the British had bought 2,200 mules for use in Burma. The U.S. Army had also impressed into service thousands of mules taken over from the Italian Army after its surrender. Toward the end of the war in the Far East 9,000 mules were flown into China from Burma for use by the Chinese Army.[4]

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2. Rand, (Capt.) John A. "Mules for China," The Cavalry Journal, (March-April 1946), 57-58.

3. Steward, (Maj.) Hal D. "Japanese Horse Cavalry, The Cavalry Journal, (July-August 1946), 64-65.

4 Jennings, (Lt. Col.) William. "Veterinary Activities in World War II," The Cavalry Journal, (November-December 1946), 41-45.

(2) Surveys of national internal security forces in Latin America, made by the U.S. Agency for International Development in 1963-1964, reveals the following paramilitary use of animals in that area:

(a) Chilean Carabineros (pp. 29 and 37)

"Horses and mules are the prime means of transportation for the rural patrol service. As of 1 February 1963 the livestock holdings of the Carabineros were 3,502 horses and 166 mules. There is a note to the effect that service in the Magallanes Prefecture is covered by 63 horses individually owned by the patrolmen."

(b) Guatemalan Border Patrol (p. 58)

"The majority of the 74 horses and mules owned by the patrol can be regarded as liabilities. Immediate disposal of 50% of current animals without replacement is recommended." [Note. Discussion of the problems of the Border Patrol in the text indicates that many of the animals were unfit for service by reason of age and poor care. Other factors considered were the disparity between forces available and length of borders to be patrolled, resulting in recommendations for the use of air patrols in lieu of horse patrols.]

(c) Ecuadoran National Police (p. 69)

"Horse patrols are used in rural areas. Some are also used in metropolitan areas for the control of crowds. The quality of the mounts used in Quito is very poor."

(d) Panama: The Cavalry Squadron (p. 18)

"The squadron is organized into two platoons and a 14-man band. They ride in parades and ceremonies and are supposed to perform civil disturbance control duties if required. The cavalry is supposedly able to muster 50 mounted troops should the need exist. Horses are not conditioned and men not trained in employment or care of animals."

(e) Peruvian National Police (p. 12)

"The mounted patrol has 2,000 horses and mules and is used primarily in those areas inaccessible by roads. Fodder, medical supplies and instruments are lacking, which adversely affects the efficiency of the patrol in extended border zones."

References in newspapers and magazines to the mandatory employment of horses and mules by police and constabulary indicate such employment in Venezuela, Colombia, Argentina and Bolivia. There was no significant information in this literature other than that animals were used to patrol regions inaccessible to vehicular patrols.

(3) The use of horses by Colombian guerrillas in the llanos from 1949 to 1954 has been reported as follows:

> "Guerrilla techniques were developed to suit specialized situations. Rafael Rangel and his large cuadrilla on the middle Magdalena virtually controlled the traffic on the river and stopped boats and launches at will to search them and take arms, drugs and food. The guerrillas on the plains took advantage of the mobility provided by horses to strike targets suddenly and disappear once more into the vast llanos. The guerrillas in the highlands made use of the ruggedness of the country and their knowledge of it in their attacks, escapes and defense of fixed positions. These varied techniques greatly complicated the problems of the government forces in coping with the Liveral guerrillas."*

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* Daniels, James M. Rural Violence in Colombia Since 1946 (unpublished manuscript, 1964, available in Special Operations Research Office Library, Washington, D.C.), p 280.

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